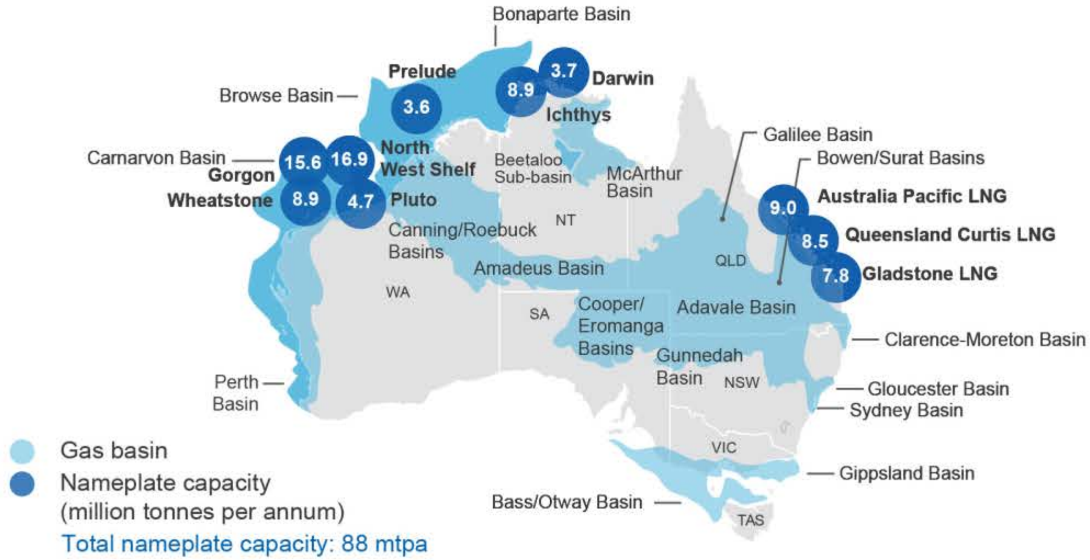
Gas

Australia's LNG projects and gas basins



Gas facts

LNG is produced by **cooling natural gas to -161°C**

LNG shrinks to 1/600th the volume of natural gas

LNG accounted for 12% of global gas demand in 2020

Natural gas accounted for **23% of the world's primary energy mix** in 2019

Global gas use by sector

20% **Industry**

19% **Transport**

22% **Residential**

40% **Electricity**

Australia's LNG

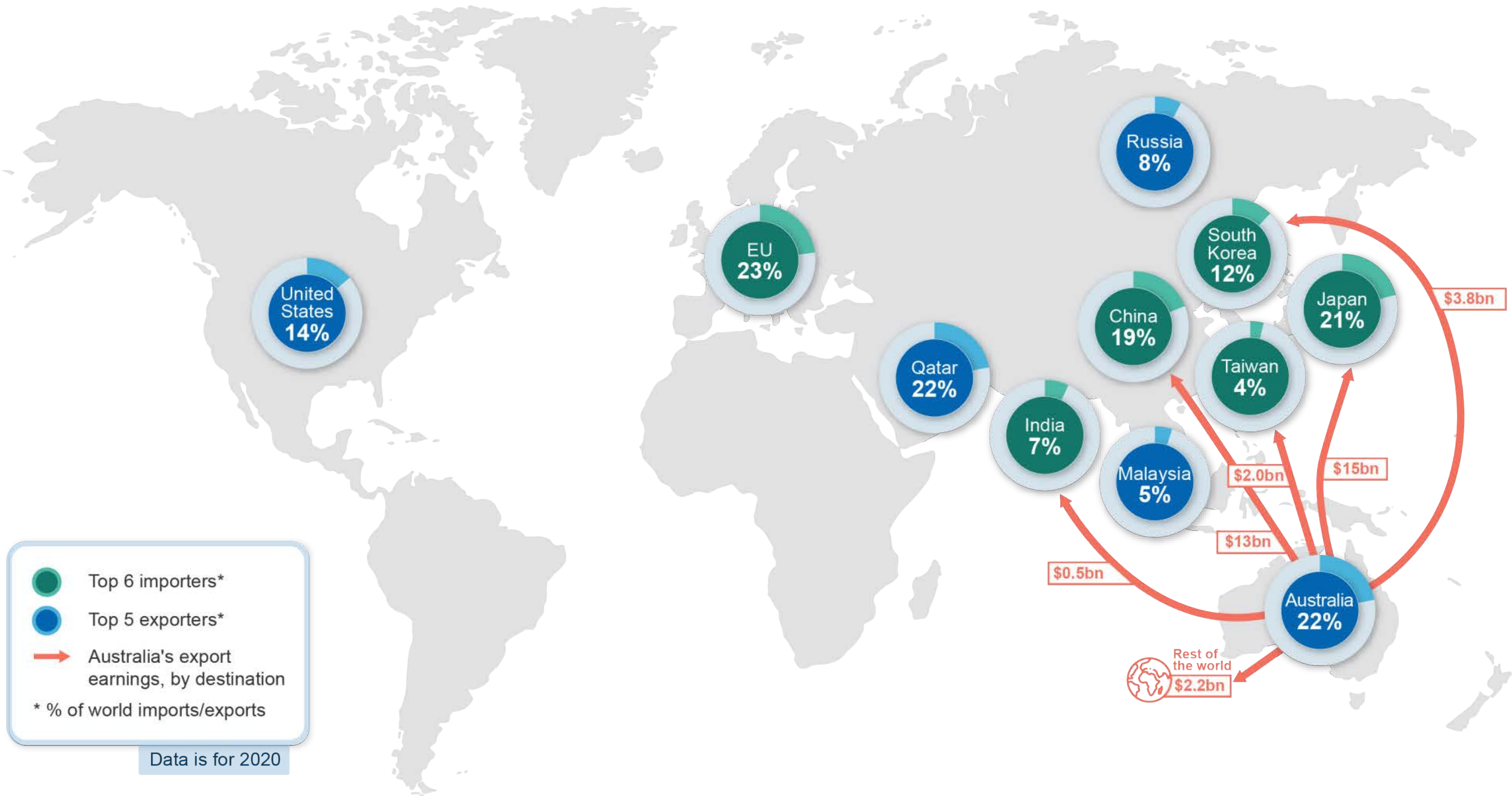
78m tonnes exported in 2020, valued at **$36bn**

Total **LNG nameplate capacity** is **88m tonnes** per annum

Around **3/4** sold on **long-term contracts**

LNG

Trade map | December 2021



Data is for 2020

7.1 Summary

- Asian LNG spot prices and oil-linked contract prices are expected to moderate in 2022 and 2023, as the LNG market remains well supplied and oil prices stabilise around US$70 a barrel.
- Australian export volumes are forecast to increase by 6.5% to 82 million tonnes in 2021–22, as major technical issues are resolved at several plants, and stay stable at 82 million tonnes in 2022-23.
- Australia's LNG exports earnings are forecast to rise from $30 billion in 2020–21 to $63 billion in 2021–22, as oil-linked contract prices surge. Export earnings are forecast to be $55 billion in 2022–23.

7.2 World trade

LNG trade growth driven by Asia-Pacific

Global LNG trade is expected to grow by 2.5% in 2021, as the global economy shows a strong recovery from the COVID-19 pandemic. A number of extreme weather events also raised demand, as the Northern Hemisphere built inventories after a bitter winter, followed by a hot Asian summer and sustained droughts in South America (that affected hydro generation). Asia remains the key driver of import growth, with an impressive 22% growth expected in 2021, largely driven by Chinese demand. High spot prices weighed on demand in some emerging Asian economies, but overall Asian demand remained high.

Various approaches to net-zero policies are expected to affect demand differently — in some cases, including South Korea and India, supporting higher gas demand and in other cases, such as Japan, moving away from gas as a fuel source.

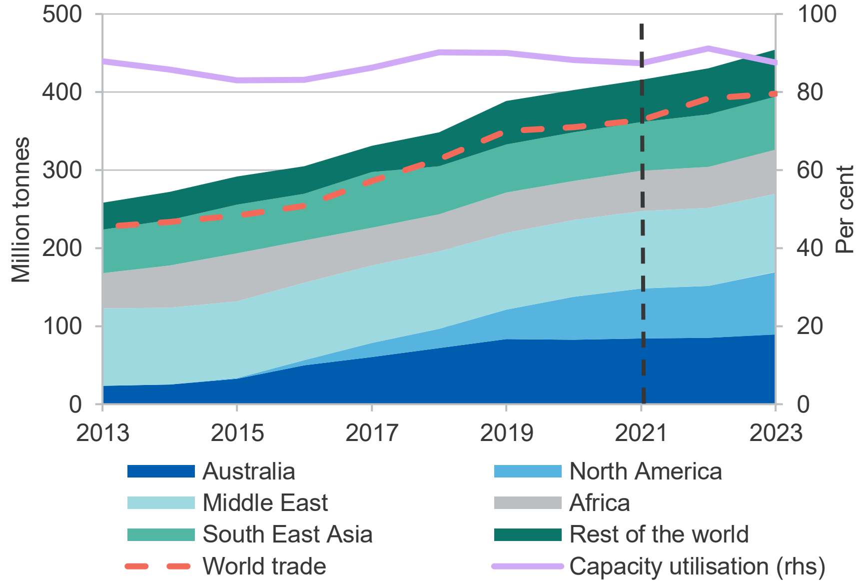
Export growth has been dominated by North America, largely due to the 50% rise in liquefaction capacity since the beginning of 2020. There has been mixed export performance from other regions; exports from the Asia-Pacific have largely been flat, and the Middle East has seen only moderate growth.

The increase in global trade has resulted in a tightening in the LNG shipping market. Spot charter rates have more than doubled from 2020.

Cross Pacific Basin supply routes — from North America into Asia — have seen a considerable increase in traffic, especially through the Panama Canal which saw a record year for LNG tonnage in the US fiscal year 2021 (October 2020 to September 2021).

Global LNG trade is expected to increase by 7.2% in 2022 and by 1.4% in 2023, as demand growth cools following the COVID-19 recovery and the increase in demand from emerging Asia is partially offset by decreasing demand elsewhere. It is expected that there will be periods of market tightness during the outlook as there is minimal supply growth through to 2023. (Figure 7.1).

Figure 7.1: LNG demand and world supply capacity



Source: Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

7.3 World imports

Japanese LNG demand to slow in pursuit of net-zero

Japan imported 61.1 million tonnes of LNG in the first ten months of 2021 — marginally higher year-on-year — as its economy recovered from the impacts of the COVID-19 pandemic. However, LNG demand generally remains on a downward trend, with Japan predicted to lose its position as the top global LNG importer to China during 2021 (Figure 7.2). As at October 2021, Japan had imported 4.4 million tonnes of LNG less than China. Import volumes are not expected to be high in the December quarter: Japanese LNG inventories were at a 5 year high as winter began, allowing Japanese utility companies to avoid buying at high prices. However, cooler than average weather is predicted for Japan over the winter. Against a backdrop of a drawn out nuclear restart process and maintenance at some coal plants, this would drive up gas demand.

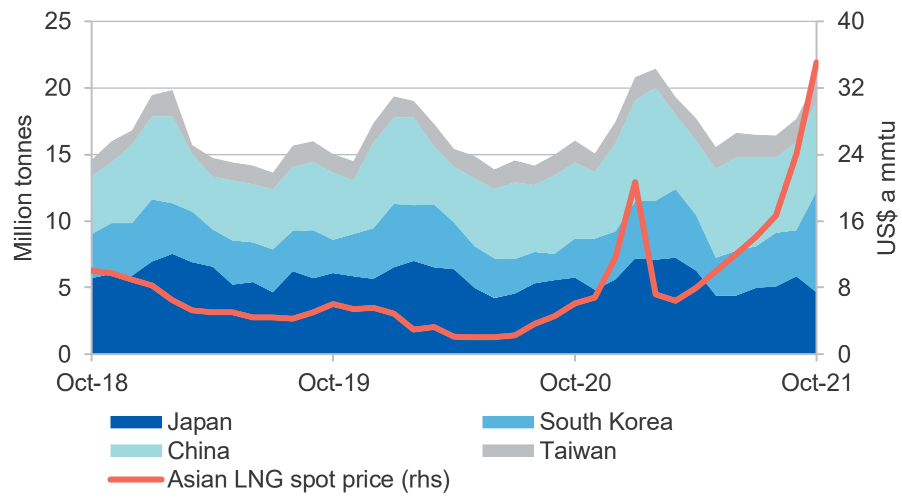
Following the announcement of a net zero by 2050 target in October 2020, the Japanese Government approved the 6th Strategic Energy Plan in October 2021, which details provisional power generation mix targets for 2030. The draft plan incorporates a large swing towards nuclear and renewables generation, with the share of gas proposed to decline from 37% to 20%. While increasing nuclear generation has been a centrepiece of Japanese energy policy for some time now, the rate of increase in nuclear power generation remains slow (at 6% of total). As at November 2021, only 10 of 33 potentially operable nuclear reactors are online.

Japan's LNG imports are estimated to be steady at 74 million tonnes in 2021, supported by delays on nuclear power plant restarts caused by safety and anti-terrorism upgrades, as well as local community pressure. LNG imports are expected to fall in 2022 and 2023, due to energy efficiency improvements and higher nuclear output.

China forecast to be the world's largest LNG importer in 2021

LNG imports were lower in the September quarter 2021, down 7% year-on-year, due to the high Asian spot prices. High gas prices have led to cuts in usage in the transport sectors and a slowing of demand growth from the industrial sector, but have not stopped a significant stockpiling effort. LNG consumption in the December 2021 and March 2022 quarters will be highly dependent on weather, with the National Climate Centre predicting a weak-to-moderate La Nina event which may bring colder than average weather and increase demand. The resurgence of COVID-19 outbreaks remains a downside risk to consumption.

Figure 7.2: Asian LNG imports and spot price



Source: Bloomberg (2021); Argus (2021)

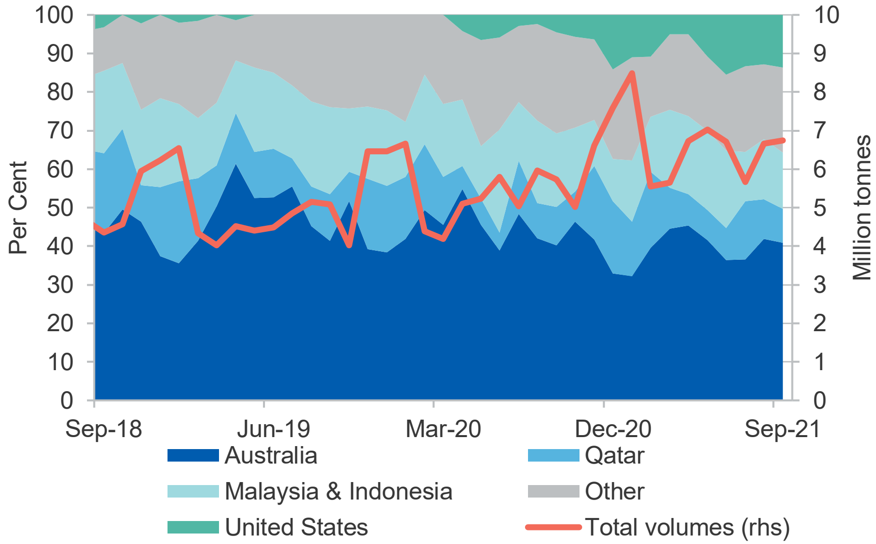
China's demand for gas is expected to increase by around 13% in total over the outlook period — driven by the industrial and residential sectors and ongoing coal-to-gas switching. The Chinese Government's 14th Five Year Plan indicates that gas will play an important role in the energy transition neded to meet its 'carbon-neutral by 2060' pledge. Whilst growth is expected across all supply sources — domestic production, pipeline imports and LNG imports — it is likely that the pace of growth of domestic production and pipeline imports will outstrip LNG in the near term.

It is expected that China will become the world's largest LNG importer in 2021, importing 80 million tonnes of LNG — 6 million tonnes more than Japan. While the share of LNG in Chinese gas demand is estimated to decline marginally in 2021 — from 28% in 2020 to 27% — Chinese LNG imports are expected to continue to grow significantly to meet energy demand, rising by an average 5.4% per year over the next two years.

China currently has a pipeline of 24 new or expansion projects under construction to increase regasification capacity. As a result, it is projected that terminal capacity will grow faster than demand during the outlook period. It is also expected that China will increasingly turn to the spot market to source additional LNG, as a considerable gap is emerging between demand for LNG and their contracted volumes.

In 2020, Australia accounted for the largest share of China's LNG imports, at around 43% (Figure 7.3). However, throughout 2021, China has typically sought to diversify its LNG sources, signing new supply contracts with the US and Qatar, and seeking other suppliers on the spot market.

Figure 7.3: China's gas supply by source



Source: Bloomberg (2021); National Bureau of Statistics of China (2021) General Administration of Customs

South Korea's LNG demand to increase due to coal-to-gas switching

In 2020, South Korea's LNG imports were weighed down by the combined impacts of the COVID-19 pandemic on power demand, increasing nuclear generation, and high levels of gas inventories. Overall, imports fell 4.8% to 40 million tonnes in 2020. Demand has recovered in 2021, with 38 million tonnes consumed in the first ten months of 2021, up 17% compared to the first ten months of 2020. Growth has been driven by the ongoing economic recovery and the continued trend of coal-to-gas switching. Nuclear power generation is expected to increase in the December quarter, as the Hanbit No. 4 reactor is brought back online, which may adversely impact LNG demand. Growth in LNG imports is expected to be relatively modest in 2022 and 2023, as new nuclear and coal capacity puts downward pressure on LNG usage in the power sector.

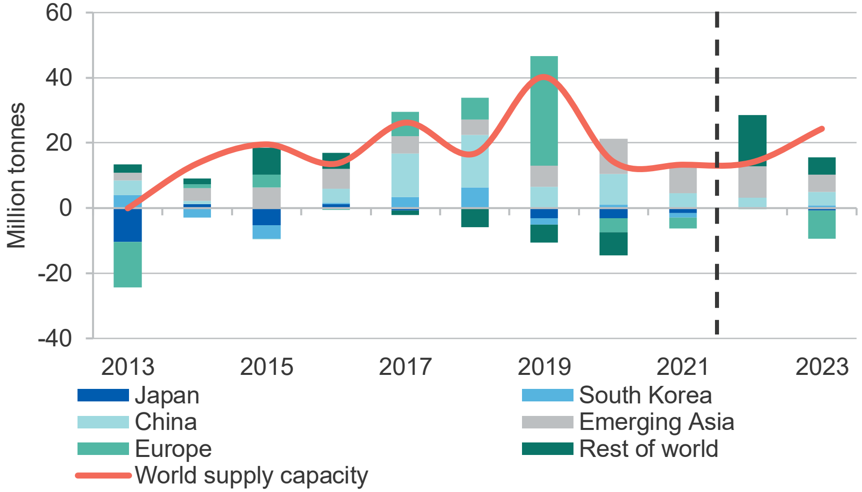
Following the announcement of a 'net zero by 2050' target in late 2020, the South Korean Government has released a number of detailed strategies — including the 14th Natural Gas Plan — which outline the country's move to net-zero through an increase in renewables and a move away from both nuclear and coal-fired power generation. These policies are expected to directly support LNG imports through to 2034.

Taiwan's LNG demand dependent on new import terminals

In the first nine months of 2021, Taiwan's imports have been strong, reaching 14.5 million tonnes. Gas-fired power generation is expected to continue to grow through the outlook period, as the government pursues a policy which would see all nuclear power phased out by 2025. Gas is expected to make up 50% of the electricity mix by 2025, up from 35% in 2020.

Taiwanese LNG imports are forecast to be fairly stable at 18 million tonnes over the outlook period. Taiwan's existing LNG import terminals are both operating at full capacity. The government has announced three new import terminals are now in the project pipeline. A referendum will be held on 18 December 2021 allowing the public to vote on the proposed location of the first terminal, after concerns were raised by environmental groups.

Figure 7.4: World LNG import changes



Notes: Emerging Asia includes India.
Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

Indian LNG demand remains volatile and price sensitive

India's LNG imports are likely to be lower in 2021 than 2020, with demand mildly impacted by the surge of COVID-19 cases earlier in the year, and then noticeably impacted by the high spot prices later in the year. Indian LNG buyers are highly price sensitive and cut LNG imports as spot prices reached record highs, both in early 2021 and in the second half of the year. Buyers in India left several spot LNG tenders unawarded due to the high prices. India's LNG imports were 3% lower year-on-year in the first nine months of 2021. Overall, 2021 LNG imports are expected to be around 24 million tonnes, 8% lower than in 2020.

Looking forward, India's LNG demand growth depends on a number of factors. In the near term, domestic gas output will continue to surge, with output expected to rise 17% in 2021, and further gains expected in 2022 and 2023. In addition, a range of infrastructure — including import terminals and pipeline connections to transmission systems — is expected to come online over the outlook period, lifting LNG demand prospects.

European imports down as cargoes diverted to Asia

Europe is currently experiencing an energy shortage, with prices for oil and gas rising to well above recent averages. This is forcing gas-to-coal switching at a time when coal prices are also historically high. A number of factors have contributed to the current crisis. Energy demand has surged, as the economy recovers from the COVID-19 pandemic amidst a successful vaccine roll-out. Extreme weather events — including a colder-than-average winter in 2020–21 — have further added to demand. On the supply side, lower than expected renewable generation has coincided with supply chain disruptions, including lower Russian pipeline gas flows and low domestic production in Europe. As a result, European gas prices have soared, with TTF prices increasing over 500% year-on-year.

Whilst Europe has traditionally played a key role in balancing the global LNG market — absorbing excess supply through to its extensive storage capacities — it has entered the 2021–22 winter with gas inventories significantly below its 5-year average. As Asian economies, especially Japan, Korea and China, have endeavoured to replenish gas stockpiles over 2021, there has been increased competition for spot LNG cargoes, and Europe has routinely been priced out. As a result, overall LNG imports are expected to be slightly down in 2021.

The European gas market is expected to be tight for some time — with limited signs of any significant increase in Russian supply and continued demand competition from Asian countries. The level of Europe's gas inventories at the end of winter will be a significant factor in the tightness of the market throughout 2022. BNEF modelling predicts that a colder-than-average winter could see Europe's storage fall as a low as 4%.

Looking forward, European LNG import demand is forecast to fall, reflecting the ramp up of two new gas pipelines and a general softening of gas demand (Figure 7.4). The Trans Adriatic Pipeline began commercial operations in November 2020, and has an annual nameplate capacity of 10 billion cubic metres (about 7.4 million tonnes of LNG). In the first half of 2021, 3 billion cubic metres were delivered through the pipeline, with more than 5 billion cubic metres expected over 2021 as a whole.

The other European gas pipeline, Nord Stream 2, has faced delays due to geopolitical tensions. The first line has been laid, and US President Biden announced in May 2021 that the US Government was waiving sanctions on the companies involved with Nord Stream 2. Gas is not expected until January 2022 at the earliest. The pipeline will transport up to 55 billion cubic metres of pipeline gas each year from Russia to Germany (equivalent to 40 million tonnes of LNG).

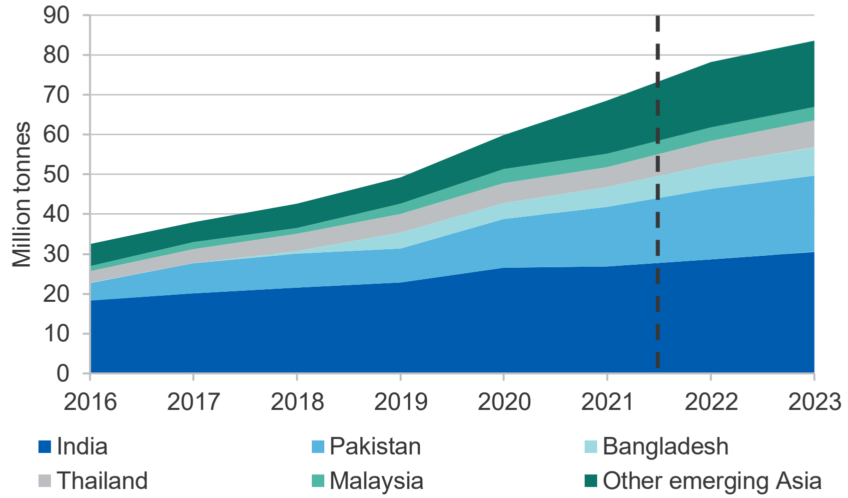
As a result of assumed higher pipeline gas imports, European LNG imports are forecast to fall from 82 million tonnes in 2020 to 69 million tonnes in 2023.

Emerging Asia to significantly increase LNG imports

Other South and South-East Asian economies were a major source of demand growth in late 2020 and throughout 2021. Unlike India, both Bangladesh and Pakistan's LNG imports have been resilient to high prices and COVID-19 disruptions this year. Pakistan's LNG imports are estimated to grow by 14% in 2021, compensating for domestic gas decline and growing industrial demand in the wake of the recovery from the COVID-19 pandemic. Bangladesh's LNG imports are estimated to grow by 17% in 2021, led by the industrial and energy sectors. In the short term, re-gasification capacity is hindering further growth, however, both nations have set plans to add further capacity.

Over the outlook period, imports by emerging Asian economies are expected to increase, due to declining domestic gas production, the expansion of gas-fired power generation and new LNG infrastructure developments. Individually, these countries are relatively small importers of LNG, but collectively are expected to account for a noticeably larger share of global LNG demand. The region (including India) is forecast to import 84 million tonnes of LNG in 2023; 44% higher than 2020 volumes (Figure 7.5).

Figure 7.5: LNG imports from emerging Asian countries



Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

7.4 World exports

Outlook for investment in new supply looks promising

In 2020, weak spot LNG and oil prices, along with the general uncertainty from the COVID-19 pandemic, caused multiple final investment decision (FID) deferrals. Only one liquefaction project was approved — Sempra Energy's 2.5 million tonnes per annum (mtpa) Costa Azul project in Mexico. At the end of 2020, global LNG capacity was about 450 mtpa, with another 125 mtpa of capacity being built or sanctioned for development.

However, with high spot prices and global demand for LNG showing no signs of slowing down, investment momentum has been building. 45 mtpa of new capacity has been sanctioned to date in 2021. A FID was made on Qatar Petroleum's 33 mtpa North Field East project, worth US$29 billion and potentially the world's largest LNG project by capacity. Woodside made a FID on the $16.5 billion Scarborough and Pluto Train 2 project in late November.

There is a significant pipeline of projects expected to make FID in 2022. These projects span the US, Canada, Qatar and Russia, and could result in over 82 million tonnes of additional capacity being sanctioned. With a majority of these projects not starting production until after 2025, it is likely there will be significant periods of market tightness over the outlook period, as global demand increases rapidly but supply is largely constrained.

US exports to rise in the short-term

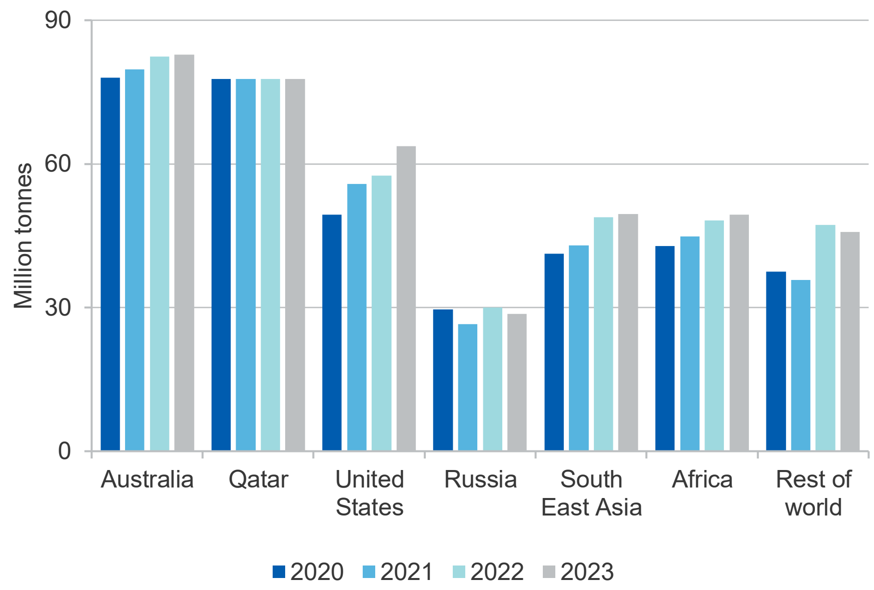
Despite record lows in the US in mid-2020, US LNG exports recovered strongly in the latter half of 2020, to reach record-highs in March 2021. Since then, export volumes have stabilised between 5.6 and 6.6 million tonnes each month; a historical high. The June quarter 2021 saw the highest LNG exports on record at 18.6 million tonnes. The September quarter, which included some routine maintenance, was close behind at 18.4 million tonnes. The large price differences between the domestic Henry Hub price and the spot prices in European and Asian markets has been driving higher than average US LNG exports. Exports are expected to remain strong in the December quarter 2021, with no routine maintenance scheduled. High prices are expected to see exports remain strong heading into 2022.

It is expected that the Calcasieu Pass facility and the Sabine Pass Train 6 will begin ramping up production in late 2021 or early 2022, with first shipments some time afterwards. These two projects combined could eventually add 15 million tonnes of liquefaction capacity. However, the Calcasieu facility is likely to have a very gradual ramp up, due to its modular infrastructure.

Qatar exporting at maximum capacity

Amidst the energy crisis and strong global demand for LNG, the Qatari Government has stated that the nation is operating at maximum capacity and is unable to increase exports to boost global supply. Significant investments have been made to expand Qatar's LNG capacity, most notably the $US29 billion North Field East project — scheduled for completion in late 2025. This project could lift Qatar's export capacity to about 110 million tonnes, from its current 79 million tonnes.

Figure 7.6: Outlook for global LNG exports



Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

Qatar's LNG exports are forecast to be relatively steady between 2021 and 2023, at about 79 million tonnes, with high levels of capacity utilisation (Figure 7.6).

Shipping data indicates that Qatar was likely the world's largest LNG exporter in 2020, slightly surpassing Australia. However, given the marginal difference between the two country's exports, and uncertainty surrounding the precise level of Qatar's LNG exports, an accurate assessment is difficult. However, Australia is expected to export higher amounts than Qatar over the outlook period.

7.5 Prices

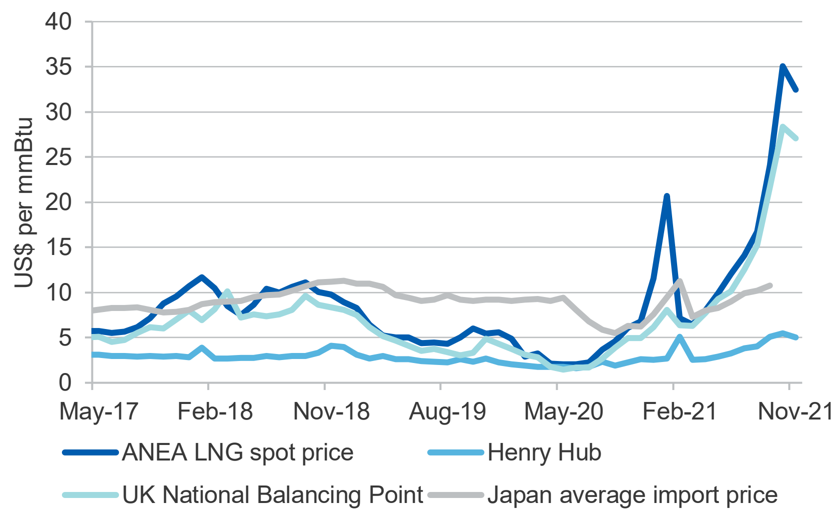
LNG spot prices have continued to show extreme volatility

Asian LNG spot prices have been highly volatile throughout 2021. Low inventories left the market vulnerable to supply problems and stronger than expected demand. Prices spiked to a record price of US$39.7 a mmBtu on 13 January 2021 (due to a bitterly cold Northern Hemisphere winter), before falling back. After averaging US$9.95 a mmBtu in May, the price rose to US$35.1 a mmBtu in October. On 6 October 2021, prices broke the record for a second time in 2021, reaching US$42.1 a mmBtu.

The steady increase in North East Asian spot prices has been driven by a number of factors, including the 'energy crisis' that has been occurring throughout Europe and parts of Asia. A colder-than-average Northern Hemisphere winter of 2020–21 left both Asia and Europe with heavily depleted gas storage levels, leading to increased competition in the spot market as both major importing regions sought to complement contracted cargoes. Against this backdrop, in Europe lower renewable generation, lower levels of domestic gas supply and interruptions to Russian pipeline supply have all pushed TTF and NBP prices to extremely high levels. The Asian LNG spot price has tracked closely to the TTF price over this period, as arbitrage plays kicked in. Against this backdrop, there were also significant supply disruptions to the global LNG market, which peaked in May-June 2021. These disruptions removed as much as 17 million tonnes of capacity from the market, largely due to maintenance deferred from 2020 due to COVID-19.

North-East Asian spot prices are expected to average US$33.5 a mmBtu in the December quarter 2021. Prices are expected to hold at a relatively high level through the rest of the Northern Hemisphere winter, although this will be dependent on the severity of the winter weather. Winter storage levels in Japan and Korea are very healthy, while Europe is still sitting well below its 5 year average. In this environment, a repeat of last winter's harsh conditions could push European storage as low as 4% which would have a significant impact on prices in 2022. Against this backdrop of market tightness, prices have been highly responsive to any supply-side announcements — for example on 17 November, North Asian spot prices jumped US$4.50 on the announcement of unplanned maintenance at Australia's Gorgon facility.

Figure 7.7: Global gas and LNG prices, monthly



Notes: ANEA is the Argus Northeast Asia spot price. LNG prices are DES (Delivered Ex Ship), which include shipping and insurance.

Source: Argus (2021); Bloomberg (2021)

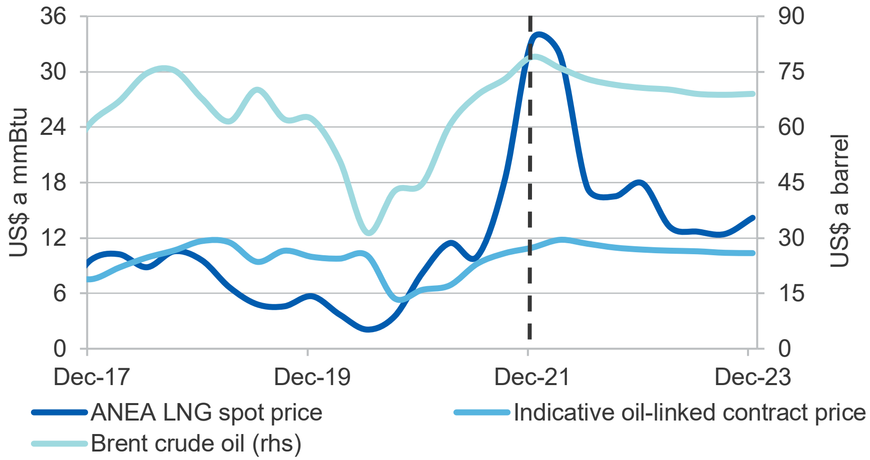
The price is expected to average US$31.8 a mmBtu in the March quarter 2022. After this, prices are expected to fall noticeably. Prices are expected to average US$17.3 a mmBtu for the remainder of 2022, and US$13.1 a mmBtu in 2023. Prices are expected to pick up in the December quarter 2022, reflecting higher demand in the northern hemisphere winter (Figure 7.8).

Oil-linked prices forecast to remain high for some time

Almost 70% of the LNG traded in Asia is sold via long-term contracts that link the price of the LNG to the price of oil (commonly the Japanese customs-cleared crude price), typically with a lag of around three to six months — depending on contractual arrangements.

Oil prices averaged US$73 a barrel in the September quarter 2021, driven by supply restraint by major producers — especially OPEC+ members — and a strong rebound in consumption. Due to the contract lag of several months, these oil prices were reflected in LNG contract prices in the December quarter 2021 and into the March quarter 2022.

Figure 7.8: ANEA LNG spot and contract prices, quarterly



Notes: ANEA is the Argus Northeast Asia spot price. LNG prices are DES (Delivered Ex Ship), which include shipping and insurance. The long-term oil-linked contract price is indicative, and is estimated at 14% of the 3-month lagged JCC oil price plus shipping.

Source: Argus (2021); Bloomberg (2021); Department of Industry, Science, Energy and Resources (2021)

Contract prices are bound to have increased further in the December quarter 2021, reflecting ongoing oil price gains. In the first two months of the December quarter 2021, oil prices were sitting consistently above US$80 a barrel, although some nations are looking at taking measures to ease the oil price by releasing reserves. In the December quarter 2021, oil prices are expected to average about US$79 a barrel (see *Oil chapter*).

Over the outlook period, oil-linked contract LNG prices are expected to fall slightly, as oil prices settle back. Oil prices are forecast to settle at around US$70 a barrel over the outlook period. However, current high prices are likely to continue to flow through LNG contracts for another 12 months.

7.6 Australia

Australia's LNG export volumes recovering from production issues

Australia's LNG export volumes have been relatively resilient throughout the COVID-19 pandemic, with fluctuations in export volumes largely explained by technical issues and routine maintenance. In the September quarter 2021, Australia's LNG exports totalled 21.4 million tonnes, up 14.4% quarter-on-quarter and 16.2% year-on-year. The increase in production has largely been driven by the resolution of issues at Gorgon, Prelude and Ichthys LNG plants in the June quarter.

Production at Gorgon has increased following the completion of repair works at the end of July. Production has been limited since May 2020, when technical issues were detected in the heat exchanger of Train 2. After repairs were completed, Train 1 was taken offline for inspection, and similar issues to Train 2 were found in January 2021. Production in the September quarter was up 53% on the June quarter 2021, and up 55% year-on-year. Production in the September quarter was 4.1 million tonnes, which is 0.2 million tonnes above nameplate capacity.

Prelude FLNG has also gone through significant production disruptions, and was offline between February 2020 and January 2021. Production has been slowly increasing, with 0.8 million tonnes of LNG shipped in the September quarter. This was around 89% of nameplate capacity on a quarterly basis. Production was up 54% compared to the June quarter.

Ichthys also experienced technical issues and routine maintenance in the June quarter, only operating at 54% of nameplate capacity. These issues were resolved in the September quarter with the facility producing above nameplate capacity.

These improvements in production have outstripped the lower production (comparing the September quarter 2021 to the June quarter 2021) from the North-West Shelf (NWS), Pluto and APLNG in the September quarter, all due to extensive routine maintenance.

Australia's export earnings recovering off the back of strong oil prices

In the September quarter 2021, Australia's LNG export earnings increased to $14.2 billion, up 62% quarter-on-quarter and 134% year-on-year (compared to the September quarter 2020). Export earnings were supported by both high LNG spot prices, averaging US$18.3 a mmBtu in the September quarter (See *Prices* section) and recovering oil prices.

Around three-quarters of Australian LNG is sold via long-term contracts that link the price of LNG to the price of oil with a lag of around three to six months, depending on contractual arrangements. LNG contract prices in the September quarter reflect Brent oil prices from the March (US$61 a barrel) and June (US$69 a barrel) quarters, which are considerably higher than corresponding quarters in 2020.

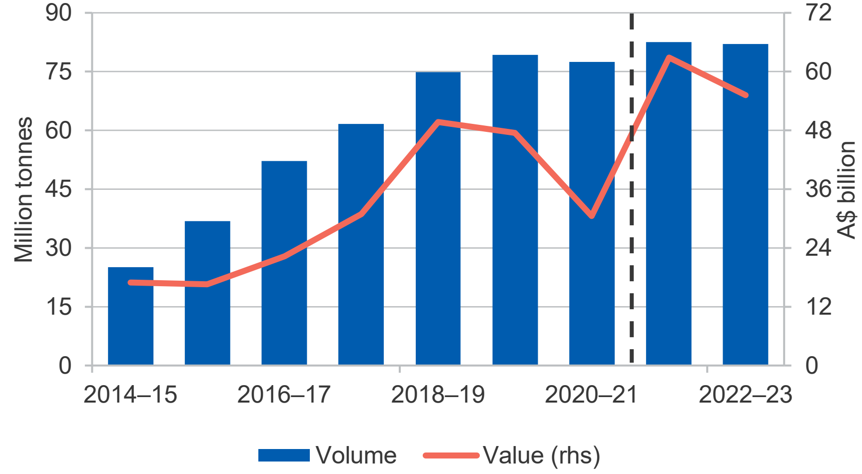
LNG export volumes expected to return to above pre-COVID-19 levels

With the resolution of major issues at both Gorgon and Prelude in the first half of 2021, export volumes are expected to recover in 2021–22 to exceed pre-COVID-19 levels, and then remain at about 94% of nameplate capacity. However, shutdowns at both Prelude and Gorgon late in the December quarter present a down-side risk to the volume forecasts, with considerable undertainty as to when the issues will be resolved.

Following a slower year for investment due to the COVID-19 pandemic, a number of FIDs have been announced in 2021. In January 2021, Santos announced a FID for an infill drilling program in the Bayu-Undan field. Production commenced in late July 2021, with initial outcomes better than expected. This program will extend output at the Darwin LNG facility, which was previously expected to halt production in 2022. This investment decision is expected to narrow the time between its depletion and the start-up of the Barossa backfill project. Santos announced a FID for Barossa on 30 March 2021, and is expecting initial gas production in the first half of 2025. Barossa is expected to extend the facility life of Darwin LNG by around 20 years.

Beach Energy inked a deal with BP Singapore to supply 3.45 million tonnes of LNG from the Waitsia gas project, processed through the NWS LNG facility, under a 5 year agreement to begin in 2023. The price structure is linked to both Brent and North East Asian spot prices, with downside price protection. It is meant to be one of the lowest cost LNG projects globally, competing on cost with the Qatari projects.

Figure 7.9: Australia's LNG exports



Source: ABS (2021) International Trade in Goods and Services, 5368.0; Department of Industry, Science, Energy and Resources (2021)

Woodside announced a FID on the Scarborough and Pluto Train 2 project on 22 November 2021.The Scarborough to Pluto LNG expansion — where a second gas processing train would be constructed, adding capacity of 5mtpa — is the only substantial expansion to Australia's LNG capacity in the investment pipeline. At $16.5 billion, this is the largest investment in Australia's upstream LNG capacity in over a decade.

According to Woodside, capacity utilisation at the NWS is expected to decline in 2022, as reserves at existing fields are depleted. NWS has secured short-term infill from Pluto (for the period 2022–2025) and Waitsia (for the period 2023–2028), which both have shorter lead times. However, large scale backfill projects are required for the longer term. Given the complex commercial arrangements associated with the NWS and high capital costs, there is potential for further backfill project delays. Browse is earmarked as backfill to the NWS, but FID for this project has been deferred until at least 2023, citing weak market conditions.

After a strong first quarter, LNG exports are forecast to rebound to around 82 million tonnes in 2021–22. In 2022–23, Australian exports are expected to remain at around 82 million tonnes.

Higher prices expected to lift Australia's LNG export earnings

Australia's LNG export earnings fell sharply in 2020–21, down to $30 billion from $48 billion in 2019–20 (Figure 7.9). The majority of this decline was due to weak contract prices, particularly in the September and December quarters of 2020.

LNG export earnings are forecast to increase to $63 billion in 2021–22. Oil-linked contract prices are expected to be higher than pre-COVID-19 levels, and earnings will also be boosted by high Asian LNG spot prices. Export values in 2022–23 are forecast to be $55 billion, as export prices fall in line with oil prices and spot prices stabilise.

Uncertainty surrounds the next wave of investment

The outlook for the next wave of investment in Australian LNG projects improved in 2021, following a number of FID defferals in 2020 due to weak market conditions (see the *Resources and Energy Major Projects 2021* publication). Most LNG projects in the investment pipeline are backfill projects — required to support the ongoing operation of existing LNG facilities.

In the next few years, it is likely that at least one import terminal will be constructed and commence importing LNG. Five potential projects have been proposed, all concentrated in south eastern Australia. The Port Kembla LNG import terminal proposed by Australian Industrial Energy (AIE) has not achieved FID, but appears to be the most advanced of the five projects. AEMO's 2021 GSOO considers the project to be 'committed', with all necessary approvals in place to commence implementation. AIE has signed a project development agreement with Jemena to connect the terminal to the Eastern Gas Pipeline, and also recently signed an agreement with Norwegian firm Hoegh to supply the floating storage and regasification unit (FSRU). The terminal is expected to be operational by mid-2023. It is likely that only one LNG import terminal in south eastern Australia will be required in the short term (to 2027).

Revisions to the outlook

Australia's LNG export earnings have been revised up by $6.8 billion in 2021–22, and by $4.5 billion in 2022–23, reflecting higher assumed LNG spot prices and oil-linked contract prices.

Table 7.1: Gas outlook

World	Unit	2020	2021[f]	2022[f]	2023[f]	Annual percentage change 2021[f]	2022[f]	2023[f]
JCC oil price[a]								
– nominal	US$/bbl	45.3	68.5	72.5	69.2	51.0	5.9	-4.6
– real[h]	US$/bbl	47.0	68.5	70.1	65.2	45.6	2.4	-7.0
Asian LNG spot price[g]								
– nominal	US$/MMbtu	4.4	18.3	20.9	13.1	319.4	14.3	-37.3
– real[h]	US$/MMbtu	4.5	18.3	20.2	12.3	304.5	10.5	-38.9
Gas production[s]	Bcm	3,975	4,087	4,198	4,261	2.8	2.7	1.5
Gas consumption[s]	Bcm	3,969	4,125	4,199	4,261	3.9	1.8	1.5
LNG trade[ds]	Mt	356.3	365.3	391.6	397.2	2.5	7.2	1.4
Australia	**Unit**	**2019–20**	**2020–21**	**2021–22[f]**	**2022–23[f]**	**2020–21[s]**	**2021–22[f]**	**2022–23[f]**
Production[b]	Bcm	157.6	151.7	160.4	160.4	-3.7	5.7	0.0
– Eastern market	Bcm	57.5	57.0	54.9	54.2	-0.9	-3.7	-1.3
– Western market	Bcm	85.7	80.8	89.9	90.7	-5.7	11.3	0.8
– Northern market[c]	Bcm	14.4	13.9	15.5	14.8	-3.5	11.8	-4.8
LNG export volume[d]	Mt	79.2	77.4	82.5	82.1	-2.3	6.5	-0.5
– nominal value	A$m	47,525	30,477	62,866	55,243	-35.9	106.3	-12.1
– real value[e]	A$m	49,465	31,215	62,866	54,076	-36.9	101.4	-14.0
LNG export unit value[g]								
– nominal value	A$/GJ	11.4	7.5	14.4	12.7	-34.4	93.7	-11.7
– real value[e]	A$/GJ	11.8	7.6	14.4	12.5	-35.4	89.1	-13.6
– nominal value	US$/MMBtu	8.1	5.9	11.1	10.0	-26.9	87.8	-9.4
– real value[h]	US$/MMBtu	8.4	6.0	11.1	9.8	-28.1	83.4	-11.3

Notes: **a** JCC stands for Japan Customs-cleared Crude; **b** Production includes both sales gas and gas used in the production process (i.e. plant use) and ethane. Historical gas production data was revised in the June quarter 2017 to align with Australian Petroleum Statistics; **c** Gas production from Bayu-Undan Joint Production Development Area is not included in Australian production. Browse basin production associated with the Ichthys project is classified as Northern market; **d** 1 million tonnes of LNG is equivalent to approximately 1.36 billion cubic metres of gas; **e** In 2021–22 Australian dollars; **f** Forecast; **g** 1 MMBtu is equivalent to 1.055 GJ; **h** In 2021 US dollars**; s** Estimate.
Source: ABS (2021) International Trade in Goods and Services, 5368.0; Department of Industry, Science, Energy and Resources (2021); Company reports; Nexant (2021) World Gas Model